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DEPARTMENT OF THE NAVY
Office the Chief of Naval Operations
Washington, DC 20350–2000
and
Headquarters
United States Marine Corps
Washington, DC 20380–1775

OPNAVINST 5230.24
N6/CMC (Code C4I)
18 November 1993

OPNAV INSTRUCTION 5230.24

From: Chief of Naval Operations
Commandant of the Marine Corps
To: All Ships and Stations

Subj: NAVY AND MARINE CORPS POLICY ON THE USE OF COMPACT DISC TECHNOLOGY

Ref: (a) OPNAVINST 5510.1H
(b) SECNAVINST 5239.2 (NOTAL)
(c) OPNAVINST 5239.1A

Encl: (1) Interim Guidance for Destruction of CDs
(2) CD–ROM and Operating System Standards
(3) CD–ROM Production Guidelines

1. Purpose. To facilitate the smooth and effective transition of the Navy and Marine Corps to Compact Disc (CD) technology as the preferred media for storage and dissemination of data and information.

2. Scope. This instruction applies to all components and activities within the Navy and Marine Corps.

3. Background. Many naval commands have recently implemented programs using CD technology. This instruction is designed to encourage and support those efforts, offering avenues for coordination between current and prospective CD originators and their users, and facilitate the aggressive use of this technology.

4. Definitions. For the purpose of this instruction, the term CD technology encompasses all compact disc applications (e.g., CD–ROM, CD–R, CD–I, CD–ROM/XA, and others as they develop).

a. Compact Disc-Interactive (CD–I). A compact disc format that holds data, audio, still and full motion video, and animated graphics. CD–I discs require unique CD–I player and are incompatible with a CD–ROM drive. The standards for CD–I, developed by Philips and Sony, are defined in the Green Book.

b. Compact Disc-Recordable (CD–R). A CD format that allows local recording of data to the disc. The two forms of CD–R are Compact Disc-Magneto Optical (CD–MO) and Compact Disc-Write Once (CD–WO). CD–MO discs may be written to, erased, and rewritten. CD–WO discs may be written to, but not erased. Standards for CD–R are under development and will be published in the Orange Book.

c. Compact Disc-Read Only Memory (CD–ROM). An optical storage, read-only, compact disc format used to hold text, graphics, and audio. CD–ROMs hold in excess of 600 Mb of data, which is equivalent to about 250,000 pages of text or 20,000 medium resolution images. The standards for CD–ROM are defined in the Yellow Book.

d. CD–ROM Extensions. Software which extends a normal Disk Operating System (DOS) for use with CD peripherals.

e. Compact Disc-Extended Architecture (CD–ROM/XA). A version of CD–ROM that allows audio to be played concurrently while viewing data. Developed by Sony, Philips and Microsoft, CD–ROM/XA allows for data (text and pictures) to be viewed and narrated at the same time. The specifications are described in the Yellow Book.

f. Data Conversion. Converting data to a form suitable for delivery on compact disc.

g. Digitizer. An input device (such as a scanner) which converts analog data or signals into digital form.

h. Green Book Standard. The specifications that describe the physical attributes for the method in which video, audio, and data are laid out in frames on a CD–I. This document may be obtained from

American CD-I Association, 11111 Santa Monica Blvd., Los Angeles, CA 90025; phone (310) 444-6619.

i. ISO 9660. The international standard which describes the file structure for placing computer files on compact disc. This standard may be obtained from the American National Standards Institute (ANSI), 1430 Broadway, New York, NY 10018; phone (212) 642-4900.

j. Orange Book Standard. The draft specifications that describe the physical attributes associated with CD-Rs. This standard is divided into two modes: one for CD-MO (rewritable) and one for CD-WO (write once). This document is under development and not yet ready for distribution.

k. Search and Retrieval Software. A program that facilitates rapid access and location of information by user-specified criteria (i.e., indexing, keyword, keyphrases, etc.).

l. Small Computer Systems Interface (SCSI). An interface system for connecting multiple peripheral equipment to computers through a bus.

m. Yellow Book Standard. The specifications, developed by Philips and Sony, that describe the physical attributes for CD-ROMs and CD-ROM/XAs. This document (1SO 10149: 1989) may be obtained from ANSI (see paragraph i.)

5. Objectives

a. Inform and educate naval commands about CD technology.

b. Provide naval activities with guidance in making decisions on using CD technology.

c. Support the conversion of data from paper, microfiche, microfilm, magnetic tape, and other media to CD.

d. Institute measures of control and procedures for producing and applying CD products at all naval activities ashore and afloat.

e. Specify the standards for use of CD technology within the Navy and Marine Corps.

6. Policy

a. General. All naval organizations providing or contracting to provide instructions, directives, publications, technical manuals, training courses, databases or their updates, logistics and supply information, and any other periodically distributed reference information will evaluate and consider use of CD technology as the preferred method of dissemination.

b. Security

(1) All CDs containing classified information will be safeguarded and bear classification markings in accordance with references (a), (b), and (c). Sleeves and holders of CDs will also be so marked.

(2) Documents containing classified information will be formatted such that when printed, classification markings for each page and paragraph will also be printed as required by reference (a). Software on the CD providing a print capability will support this requirement.

(3) Although encryption methods exist for enhancing security of information on CDs, the current state of encryption technology is impractical, expensive, and not standardized. Therefore, CD encryption procedures are not addressed in this instruction. The Office of Naval Intelligence (ONI) is responsible for determining encryption techniques for future security requirements and recommending appropriate techniques to the Configuration Control and Management Board (CCMB) for naval implementation. This instruction will be amended when standard encryption guidance is available.

(4) The National Security Agency (NSA) is exploring methods for destroying CDs. Enclosure (1) provides interim guidance to avoid serious health risks that may be incurred from destruction of CDs.

c. Production. Production services (pre-mastering, CD-R, mastering, and replication) are available through the Defense Printing Service (DPS). Naval commands are encouraged to use these services when considering CD production.

7. Responsibilities

a. Chief of Naval Operations (CNO N6) will:

(1) Provide overall guidance and direction for conversion to CD technology throughout the Navy.

(2) Participate as a member of the Configuration Control and Management Board (CCMB).

(3) Ensure the exchange of information with DoD services and agencies.

b. Commandant of the Marine Corps (CMC CSA) will:

(1) Provide overall guidance and direction for conversion to CD technology throughout the Marine Corps.

(2) Participate as a member of the CCMB.

(3) Ensure the exchange of information with DoD services and agencies.

c. Commander, Naval Computer and Telecommunications Command (COMNAVCOMTELCOM) and Director, Marine Corps Computer and Telecommunications Activity (MCCTA) will:

(1) Coordinate the use of CD technology within their respective services.

(2) Jointly chair the Configuration Control and Management Board (CCMB).

(3) Assist CD originators in evaluating CD requirements, conversion needs and software.

(4) Coordinate the development of standards for producing/distributing information via CD for Navy and Marine Corps.

(5) Coordinate the implementation of CD technology with the Defense Printing Service.

d. The Director, Defense Printing Service has a decentralized organization and production infrastructure to provide CD-ROM production services to naval activities. They are tasked to conduct a coordinated DOD printing program covering the production, procurement, and the distribution of publications through conventional and alternative means. The Defense Business Operations Fund (DBOF) concept, under which DPS operates, allows for an effective implementation of Navy's CD-ROM program through consolidation of requirments. DPS will:

(1) Promote CD technology as a distribution media throughout DON.

(2) Work with CD-ROM originators on request to ensure that all technical requirements have been identified and the most economical and standard options have been reviewed.

(3) Provide outsourcing and in-house resources at DPS field offices as necessary to meet CD production requirements.

(4) Evaluate current state of the art CD production technology and implement as appropriate.

(5) Participate in the Navy and Marine Corps CCMB.

e. CCMB. As the official forum for coordinating naval CD usage, the CCMB will:

(1) Facilitate the exchange of information by naval originators and users of CD technology.

(2) Convene regularly to evaluate and modify, as required, naval CD standards.

(3) Review the current and emerging technologies and software, and evaluate their usefulness in meeting end user requirements.

(4) Ensure current information on CD technology is available to the naval community.

(5) Maintain a registry of all naval CD products.

(6) Coordinate with CNO (N09N2) for security policy guidance.

(7) Assist in resolution of originator and end user disputes.

(8) Be composed of voting representatives from the following organizations: Chief of Naval Operations (N6); Commandant of the Marine Corps; Naval Computer and Telecommunications Command; Marine Corps Computer and Telecommunications Activity; Bureau of Naval Personnel; Naval Facilities

Engineering Command; Naval Supply Systems Command; Naval Sea Systems Command; Naval Air Systems Command; Space and Naval Warfare Systems Command; Office of Naval Intelligence; Naval Tactical Support Activity; Naval Doctrine Command, Doctrine Division, Marine Corps Combat Development Command; Naval Oceanography Command; and fleet Commanders in Chief. The following are non-voting members: Naval Computer and Telecommunications Area Master Station, Atlantic and Defense Printing Service.

f. CD originators will:

(1) Contact COMNAVCOMTELCOM (for Navy) or MCCTA (for Marine Corps) when analysis of production of CD products begins.

(2) Evaluate end user requirements and capabilities using enclosure (3) as guidance.

(3) Determine whether the target audience has a requirement for, and can support, the CD product.

(4) Develop and distribute the CD product. The Defense Printing Service (DPS) has facilities to help prepare, produce, and distribute CD products.

(5) Periodically obtain user feedback on utility of CD, and submit such feedback to the CCMB upon request.

(6) Provide technical support to users of their products.

(7) Follow Naval Warfare Publication–0 procedures for distribution of tactical CDs. Forward a copy of all Navy and Marine Corps tactical CD-ROM discs and titles to:

Naval Tactical Support Activity
Washington Navy Yard (Code 70)
901 M Street SE Building 200
Washington DC 20374–5079

(8) Forward a copy of all Navy and Marine Corps discs and titles, with point of contact information, to:

COMNAVCOMTELCOM (Code N234D)
4401 Massachusetts Avenue NW
Washington DC 20394–5460

(9) Forward a copy of all Marine Corps titles to:

U.S. Marine Corps MCCTA (Code CTAS–51)
Director, MARCORCOMTELACT
3255 Myers Avenue
Quantico, VA 22134

g. End users will.

(1) Support the minimum hardware and software configuration outlined in enclosure (2).

(2) Notify the originating activity of any problems with a CD product.

(3) Contact COMNAVCOMTELCOM or MCCTA for problems resolution, when additional assistance is required.

(4) Respond to originator requests for comments and feedback on CD products.

8. Action. Naval organizations distributing any periodically updated reference material will evaluate and consider use of CD technology as the preferred method of dissemination.

a. Commanders and commanding officers considering CD production will evaluate the information stored, means of dissemination, and ultimate audience. They will conduct a cost and benefit analysis to determine what information should be stored or disseminated in digital format. Based on analysis, convert from paper, microfiche, floppy disc, and magnetic tape to CD where appropriate. Assess initial CD start-up and changeover costs (to include benefits and costs to originators and end users) in the cost analysis. The Defense Printing Service can assist in conducting such a cost analysis.

b. All commanders and commanding officers will ensure their activities and subordinate commands are able to use compact discs by supporting at least the minimum hardware and software configurations listed in enclosure (2).

9. Standards. As technology improves, additional capabilities become available, and user requirements develop, the standards defined herein will be revised. Enclosure (2) contains the minimum naval CD standards.

10. Guidelines. Enclosure (2) contains suggested guidelines for using CD technology. The guidelines are minimum recommendations and should be consulted when producing CD products. These guidelines will be updated as necessary to stay abreast of new technology, innovations and changes.

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Distribution:
SNDL Parts 1 and 2
MARCORPS Codes PCN 710000000000 and 71000000100

Chief of Naval Operations
(Code N09B34)
2000 Navy Pentagon
Washington DC 20350–5000 (150 copies)

SECNAV/OPNAV Directives Control Office
Washington Navy Yard Building 200
901 M Street SE
Washington DC 20374–5074 (60 copies)

Stocked:
Naval Aviation Supply Office
ASO Code 103
5801 Tabor Avenue
Philadelphia PA 19120–5099 (500 copies)

INTERIM GUIDANCE FOR DESTRUCTION OF CDs

The following is quoted from the Office of the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence memorandum of 11 February 1993. This guidance will be followed until superseded by proper authority:

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Destruction of CD-ROMs - Interim Guidance

The National Security Agency (NSA) is continuing to explore methods of destroying CD ROMs to avoid serious health risks that may be incurred when such material is burned, pulverized or shredded. Pending completion of NSA's effort, the following interim guidance is provided:

CD ROMs, whether containing classified data or not, should not be disposed of by burning, shredding, or pulverizing but should be stored appropriately pending the development of final disposition instructions.

If the volume of stored CDs becomes a storage or security concern, agencies may contact the CD manufacturer to seek assurance that their product does not contain toxic substances. With manufacturers assurance relating to specific disk products, excess CDs may be smelted.

//s// David E. Whitman
Deputy Director, Security Classification and
Safeguards, DISS, ODASD(CI & SCM)

CD-ROM AND OPERATING SYSTEM STANDARDS

1. Disc Physical Standards

a. The physical properties of the disc must conform to the international standard ISO 10149; data must be recorded in the international standard ISO 9660.

b. Size - CD-ROM Physical Disc Properties ISO 10149

c. Minimum information to be printed on CD:

Originating activity name
Title or database
Inventory number
Date produced (date pre-mastered, not replicated)
Data classification (if classified)
Classification authority (if classified)
Declassification date (if applicable)
Operating environment(s) supported
"ISO 9660"
Replicator's name or logo
Version number (if disc is an update)
Volume number (if part of a set)

Classification marking color standard:
Top secret - Orange
Secret - Red
Confidential - Blue

Classification markings shall be in a minimum 18-point font size in the indicated color.

Existing discs that do not contain the above information need not be redistributed solely to update labeling information. Future releases of those products shall conform to the above standards.

d. Inventory number- An eight digit sequential number preceded by three character originator code embedded by replicator on inner rim of the CD (same number bar code on label). The originator code will be assigned to each originator by the CCMB upon request.

2. End user standards. The following standards are the minimum configurations end users must support to use the CD products they receive. To avoid obsolescence, new procurements should not conform to the minimum but should be as near state-of-the-art as affordable to ensure longer service life and greater utility. Producers of CD

products should assume their customer base supports no greater computing capability than the minimums listed below unless it is positively known that their customers have a higher baseline of computing equipment (e.g., all customers are known to possess 80386-based processors with 40 MB available disk space and Microsoft Windows).

a. Operating systems

(1) Current Minimum DOS environment:
80286 processor or higher
1 MB RAM
10 MB disk space available (hard drive, RAM drive, Bernoulli, etc.)
VGA graphic capability
VGA color monitor
Current Microsoft filename extensions and MS-DOS 3.3 or higher compatible disk operating system

(2) Current UNIX environment: TAC-3

(3) Current MAC environment: OS 7.1 or MAC/UNIX-AUX 3.0

b. CD-ROM DRIVE

(1) Internal or external drive, Multimedia PC Marketing Council (MPC) compatible

(2) Communication cable

(3) Data transfer rate - 150KB/sec

(4) Access time - 1 second

(5) Minimum on-board buffer - 128K

(6) Caddy (if applicable)

(7) Speaker or earphones

(8) 16 bit SCSI interface (if required)

3. Each disc will contain a flat ASCII file titled "READ.ME" with the following format and information:

a. Lines will be 80 characters or less, with a hard return at the end of each line. Descriptors (such as "DISC TITLE") will be used to introduce each new information block; desriptors will be in all capital letters and begin in column one of their line. The associated data will be in upper and lower case.

b. The READ.ME file will have the following structure. All descriptors must be used, though the associated information may state "N/A" if desired.

DISC TITLE:
[State verbatim the title of the disc. Do not include any superfluous descriptions or qualifiers.]

VERSION NUMBER:
[Provide the version of the disc, not of the individual documents on the disc.]

VOLUME NUMBER:
[If part of a set. State as "Volume 1 of 3", etc.]

DISC CLASSIFICATION:
[The highest classification of any information on the disc.]

CLASSIFICATION AUTHORITY:
[May state "Multiple Sources" if appropriate. N/A for unclassified discs.]

DECLASSIFICATION DATA:
[Date the disc becomes declassified. Based on the last declassification date of any data on the disc, or OADR if appropriate. N/A for unclassified discs.]

RELEASE DATE:
[Date pre-mastered.]

DOCUMENT IDENTIFICATION:
[List the number, title, and originator of each document or product found on the disc.]

OPERATING ENVIRONMENT SUPPORTED:
[State minimum DOS version, Microsoft Windows version, UNIX, or Macintosh version required to operate the software.]

ABSTRACT:

[Provide a brief narrative describing the CD product and its purpose. May include operating systems supported.]

ORDERING INSTRUCTIONS:
[State specifically how to request copies of the CD.]

POC:
[State point of contact for information regarding production of the CD. Include DSN/commercial phone number, mailing address, fax number, and message address where available.

FUTURE PLANS:
[May include plans for product enhancements, schedule of updates, termination of product support, or any other related information.]

ORIGINATORS COMMENT:
[Any comments desired by the originator of the CD or products on the CD.]

END:

The READ.ME file must be constructed exactly as described. It will be used to support a database of all Naval CD products to be made available throughout DON.

CD PRODUCTION GUIDELINES

1. Determining whether to convert to CD production requires answering several key questions. Among them are: what is the cost of current production (including mailing/distribution) and what would be the comparable costs for a CD product? Will the startup costs of CD production be offset by savings over a reasonable period of time? What are the capabilities of my customer base? Will a CD product fulfill all my customers' requirements?

2. The continuing conversion from paper or magnetic media to optical media is inevitable. More and more commands have access to at least basic CD services (CD drives on stand-alone computers), and CD servers on local area networks are becoming more widely available. Available processing power is increasing from a current predominance of 80286-based processors (which provide a bare minimum of CD utility) to 80486 processors, TAC-3, and beyond. This continual upgrading will give more leeway to producers of CD products as their customers can support greater capability in CD-related software and databases. For the present, however, it must be assumed that the customer base has only the minimum processing power as specified in enclosure (2) unless it is positively known otherwise. Producers potentially could put two versions (or more) of their product on a single disc: one version supporting the minimum system configuration, and an enhanced version exploiting the computing power of more current processors, audio, etc.

3. Some baseline considerations include: A single disc can hold a maximum of 660 megabytes, exceeding 300,000 pages of text. Graphics may occupy significantly more space, depending on their complexity. Printed paper equivalent to a single CD weighs 2,500 pounds, occupies 120 feet of shelf space, and costs nearly $1000 to mail. A CD weighs less than one ounce, takes less than an inch of shelf space, and costs about 75¢ to mail. It would be a challenge for any single command to fill a CD with data, so there may be merit in two or more commands working to produce a single disc with related documents. This would produce further cost savings for each participating command. NCTC, through its library of DON products, will informally try to facilitate such joint efforts.

4. The following pages contain a checklist to guide organizations as they consider commencing CD production. Many of the questions are general in nature; a more specific analysis may be necessary depending on the type of production or conversion under consideration.

d. Manpower required to create product, per release (labor and time requirements for subsequent releases will likely be less than that of the initial release). _____

e. Manpower and materials cost for CD duplication, per release. _____

f. Cost of mailing per release, including packaging (labor and materials) and postage. _____

g. Number of expected releases per year of CD product. _____

h. Total annual cost to obtain information, create CD product, duplicate, and distribute. _____

4. Can time constraints for product distribution be met with CD technology? _____

5. Can production efforts be combined with that of any other DoD organization (i.e., two agencies putting documents on a single disc? _____

a. If so, what is the commands share of the cost for creating/distributing the CD product? _____

CUSTOMER CONSIDERATIONS:

1. Can product be used in the anticipated work setting? (office space, industrial, mobile, remote/field activity, etc.) _____

2. Will product be used by few people or many people within a single command? How will it be accessed if many people must use it? _____

3. What is the customers' hardware/software capability? If customer base is too broad to be assessed, the minimum system configuration in enclosure (1) must be assumed. _____

4. Is any user training required? Can it be embedded in the CD product? Who will incur the cost of training? _____

5. Is all required software included in the CD or must customers make additional purchases to use/view the CD? _____

6. Will use of product require extensive printing by customer, as opposed to usage on-screen? Is on-screen presentation adequate in lieu of paper or previous media (e.g., representation of fold-out drawings, etc.) _____

7. Will transition from paper/magnetic media to CD be gradual or immediate? Will customers be offered their choice of media? If so, does cost of dual-media publishing offset savings from CD production? _____

ADDITIONAL CONSIDERATIONS:

1. If converting archival documents, will they be represented as graphical images or ASCII files? _____

Note: OCR conversion from raster graphics to ASCII is slow and imprecise. Error correction for OCR can be prohibitively expensive when converting large quantities of documents. If a textual search capability is not required, OCR of documents may not be necessary.

2. Does conversion to CD necessitate review of distribution list? Should commands be added or deleted as a result of the new media? _____